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10/820,613

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Kalin Spariosu

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06/30/2006

RAYTHEON COMPANY  
Patent Docket Administration  
Bldg. E04, M/S N119  
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EXAMINER

NGUYEN, TUAN N

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/820,613 | <b>Applicant(s)</b><br>SPARIOSU ET AL. |  |
|                              | <b>Examiner</b><br>Tuan N. Nguyen    | <b>Art Unit</b><br>2828                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

***Response to Amendment***

1. In respond to applicant's amendment filed 04/07/2006, claims 1, 3, 7 and 12 have been amended, and claims 13 and 14-24 have been added. Claims 1-24 are pending.
2. Amendment to specification filed 04/07/2006 has been accepted.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or non-obviousness.
4. Claims 1-3, 7,8, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemmati (US 5408480).

With respect to claims 1, 7, 8, 12, 13 Hemmati '480 shows and discloses a laser comprising: an active medium disposed within a resonator (*Fig 2: 21 laser medium within resonator mirrors 24, 25*); a material operationally coupled to said medium and having a transmittance property that varies in response to incident energy (*Fig 2: 23 Q*

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*switch material coupled to medium with transmittance varies in respond to the laser input*); and means disposed external to said medium for applying energy to said material (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch*). The claim further requires that said means having a response time that is shorter than or equal to a round trip delay time of light within said resonator. Hemmati '480 did not discretely disclose the respond time is shorter or equal to round trip delay light within the resonator, however Hemmati '480 shows and discloses in (*Fig 2: 27 low current control source controlling laser diode "26" output that switch/trigger the Q switch 23 output at a desire wavelength*) and (*Fig 1: 14 switch control driver controlling Q switch output*); it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, in this case the control source can vary from higher to lower frequency such that when a laser oscillating longitudinal is equal to an integral multiple of the transverse oscillation, then the wavelengths will phase lock. Since claims 12, 13 recites the same or identical elements/limitations it is inherent to use patents '480 to recite the method of lasing, product by process.

With respect to claim 2, Hemmati '480 discloses wherein said material is a saturable absorber (*Col 1: 60 passive Q switch – saturable absorber*).

With respect to claim 3, Hemmati '480 shows and discloses means for applying energy includes a diode laser adapted to deliver an optical pulse of duration shorter than or equal to a round trip delay time of light within said resonator (*Fig 2: 26 diode laser*

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*mean external to medium applying energy to Q switch) in (Fig 2: 27 low current control source controlling laser diode "26" output that switch/trigger the Q switch 23 output at a desire wavelength) and (Fig 1: 14 switch control driver controlling Q switch output).*

5. Claims 4-6, 9-11, 14-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemmati (US 5408480) in view of Halmos et al. (US 2002/0051470).

With respect to claims 4, 5, 9, 10 Hemmati '480 discloses the above. The claims further require the means includes focusing optics or dichroic beamsplitter disposed between said diode laser and said absorber material. It has been held that omission of an element in a combination where the remaining elements perform the same functions involves only routine skill in the art, in this case a mirror/prism/collimating lens or dichroic beam splitter can be used to directing/focusing or tuning the beam wavelength output from the diode laser prior to shinning on the saturable absorber (SA). Halmos et al. ('470) shows the use of splitter and focusing optics in the mode-lock system (Fig 1a: 130, 140, 150, 170, POLARIZER, switching means). It would have been obvious to one of ordinary skill in the art to provide Hemmati '480 the element as taught or suggested by Halmos et al. ('470) to directing/focusing/or splitting the beam wavelength output.

With respect to claim 6, 11, 14 Halmos et al. ('470) discloses and shows a quasi-monolithic diode laser assembly ring disposed external to said medium for applying energy the laser structure (*Title: a Laser Q-Switchd and Mode-locked*) (Fig 1a, 2a: 120, 150, 140 quasi-monolithic diode laser assembly ring external to said medium).

With respect to claims 15, 24 Halmos et al. ('470) disclose a dual mode laser comprising (ABSTRACT)(Sections [0008; 0009]: an active medium disposed within a resonator cavity (*Fig 1a: 100 active medium*); means for changing the length of said cavity from a first length in a first mode of operation to a second length in a second mode of operation (*Fig 1a,2a: 130, 140, 160, 170, 190*)(Section [0024-0028] means changing cavity length with first mode-locked and second Q-switching); a material operationally coupled to said medium and having a transmittance property that varies in response to incident energy (*Fig 1a: 150 Q-switch material varies in response to incident energy*);

With respect to claim 16, Hemmati '480 discloses wherein said material is a saturable absorber (*Col 1: 60 passive Q switch – saturable absorber*).

With respect to claim 17, Hemmati '480 shows and discloses means for applying energy includes a diode laser (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch*).

With respect to claim 18 Halmos et al. ('470) shows and discloses an outcoupler and a first highly reflective mirror arranged to provide said resonator cavity therebetween (*Fig 1a: 110, 190 OUTPUT COUPLER, high reflective mirror provide resonant cavity*).

With respect to claim 19 Halmos et al. ('470) shows a polarizer disposed between said outcoupler and said mirror (*Fig 1a: 140 POLARIZER*).

With respect to claim 20 Halmos et al. ('470) shows means for changing the length of said cavity includes a polarization rotator disposed in optical alignment with said medium and said polarizer (*Fig 1a: POLARIZER, 130 rotator means to change length of cavity*)(Section [0008-0009]).

With respect to claim 21 Halmos et al. ('470) shows a second highly reflective mirror in operational alignment with said polarizer (*Fig 1a: 120 HR high reflector aligned with polarizer 140*).

With respect to claim 22 Halmos et al. ('470) discloses wherein said first mode is a Q-switched mode and said second mode is a mode-locked mode (*Section [0008]*).

With respect to claim 23 Halmos et al. ('470) disclose a dual mode laser comprising (ABSTRACT)(Sections [0008; 0009] comprising: an outcoupler (*Fig 1a: 110, OUTPUT COUPLER*); a first highly reflective mirror and a second highly reflective mirror (*Fig 1a: 190, 120 HR*); an active medium disposed within a resonator defined by said outcoupler and said first mirror in a first mode of operation and second mirror in a second mode of operation (*Fig 1a: 100, 120, 190 active medium within resonator defined by OUTCOUPLER and first/second mirrors as first/second mode – Q-switching and mode-locked*)(ABSTRACT); a polarizer disposed in operational alignment with said outcoupler and said first and second mirrors and a polarization rotator for changing the

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polarization of a beam reflected by said outcoupler (*Fig 1a: 140 POLARIZER and rotator aligned with first/second mirror changing beam reflected*);

### ***Conclusion***

6. Applicant's amendment necessitated the new ground of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Tuan Nguyen



**MINSUN OH HARVEY**  
**PRIMARY EXAMINER**